

**Work Order ID 136266**

Friday, August 28, 2015 2:17:36 PM

**\*136266\***

Page 1

Item ID: D2580-1 Accept **\*N900040100\*** Setup Start **\*NS1\***  
Revision ID: Stop **\*NS2\***  
Item Name: 205 Bent Tube  
Start Date: 8/28/2015 Start Qty: 6.00 **\*6\*** Cust Item ID:  
Required Date: 8/28/2015 Req'd Qty: 6.00 **\*6\*** Customer:  
Reference:

Approvals: Process Plan: SH/LL Date: 20150901 Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

| Sequence ID/<br>Work Center ID | Operation<br>Description | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp |
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|

| Draw Nbr | Revision Nbr |
|----------|--------------|
| D2580    | G            |

100

0.00

**\*100\***

Skidtubes

**Memo**

0.04

Skidtubes

1- Inspect mat'l D2500-1-190 for damage.

2-Drill pilot holes using drill jig DT 8149 A-BC-D

3-Open holes to 0.508" as per Dwg D2580

4-Deburr holes per QSI002 section 4.2.3 and blow out all chips from inside of tube

5- Test fit inspection saddles on FWD &amp; AFT saddle holes using DT9916.

101

QC6- Inspect dimensions to drawing

0.00

**\*101\***

QC

**Memo**

0.00

Quality Control

DAS  
03  
9-99

⑥ ① 15-9-9  
⑥ ① 15-9-10

**P.T.O.**

DQA:

Date: 15/09/28



## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed:

Date: 15/09/22

Work Order update only ☐

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                                                                                                                                                                                                                                                                                                                                                                                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                           |                                                                                                                                                                            |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Work Order: <u>136266</u><br>Part No. <u>D2580-1</u><br>NCR No. <u>15-5346</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | <b>DISPOSITION</b><br>Rework <input type="checkbox"/><br>Scrap <input checked="" type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/>                                                                                                                                                                                                                                   |  | <b>AGAINST DEPARTMENT/PROCESS</b><br>Skid-tube <input checked="" type="checkbox"/> Cross tube <input type="checkbox"/><br>Machining <input type="checkbox"/> Small Fab <input type="checkbox"/><br>Thermoforming <input type="checkbox"/> Finishing <input type="checkbox"/><br>Large Fab <input type="checkbox"/> Composite <input type="checkbox"/><br>Water Jet <input type="checkbox"/> Prod. Eng. Coord. <input type="checkbox"/><br>Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/><br>Engineering <input type="checkbox"/> Quality <input type="checkbox"/><br>Other <input type="checkbox"/> |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                           |                                                                                                                                                                            |  |
| Date: <u>15-9-10</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  | Step #: <u>100</u>                                                                                                                                                                                                                                                                                                                                                                                                          |  | QTY Effective: <u>1</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | MRB (QSI042) Approval<br>DAS<br>9<br>9-89 <u>15-09-10</u> |                                                                                                                                                                            |  |
| Description Work Order Deviation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                                                                                                                                                                                                                                                                                                                                                                                                             |  | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                           | Completed By<br><u>15-9-10</u><br>Lead hand / Supervisor<br>Approval Verification<br><u>15-9-10</u><br>QC / QA Coordinator<br>Approval<br>DAS<br>9<br>9-89 <u>15-09-10</u> |  |
| While opening hole to finished size<br>hole saw "walked" away from operator<br>causing a 0.070" gash in the ridge<br>at Fwd Saddle location.<br>L.C. drill not position right                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                                                                                                                                                                                                                                                                                                                                                                                             |  | Scrap 1 D2500-1-190<br>+ Replace                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                           |                                                                                                                                                                            |  |
| <b>Root Cause</b><br>Environment <input type="checkbox"/> No Re-verification <input type="checkbox"/><br>Design <input checked="" type="checkbox"/> Operator <input checked="" type="checkbox"/><br>Doc/Data <input type="checkbox"/> Offset/Setup <input type="checkbox"/><br>Equip/Tooling <input type="checkbox"/> Supplier <input type="checkbox"/><br>Handling/Pre <input type="checkbox"/> Training <input type="checkbox"/><br>Material <input type="checkbox"/> Use for Testing <input type="checkbox"/><br>Internal Transport <input type="checkbox"/> Poor Information <input type="checkbox"/><br>Tribal Knowledge <input type="checkbox"/> Rushing <input type="checkbox"/><br>LOA <input type="checkbox"/> Product Improvement <input type="checkbox"/><br>Substation <input type="checkbox"/> Process Improvement <input type="checkbox"/><br>Past Expiry Date <input checked="" type="checkbox"/> Manufacturing Process <input checked="" type="checkbox"/><br>Misidentified <input type="checkbox"/> Past Due <input type="checkbox"/> |  | Pressure/Forced <input type="checkbox"/><br>Bending <input type="checkbox"/><br>Centre Not Concentric <input type="checkbox"/><br>Cracks <input type="checkbox"/><br>Crimp/Kink/Ripple/Wave <input type="checkbox"/><br>Cuffs <input type="checkbox"/><br>Crushing <input type="checkbox"/><br>Heat Treat <input type="checkbox"/><br>Wave/Twist in Tube <input type="checkbox"/><br>Marks/Chatter <input type="checkbox"/> |  | <b>FAULT CATEGORY</b><br>Temperature/Cure <input type="checkbox"/><br>Set-up <input type="checkbox"/><br>BOM/Route <input type="checkbox"/><br>Broken/Damage/Defect <input type="checkbox"/><br>Inspection Incomplete/Unqualified <input type="checkbox"/><br>Contamination <input type="checkbox"/><br>Countersink <input type="checkbox"/><br>Cut Too Short <input type="checkbox"/><br>Instructions Incomplete/Unclear <input type="checkbox"/><br>Drill Holes <input type="checkbox"/>                                                                                                                                          |  | Power Loss/Surge <input checked="" type="checkbox"/> Positioned Wrong <input checked="" type="checkbox"/><br>Folio/Program <input type="checkbox"/> Outside Dimensions <input type="checkbox"/><br>Grain <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/><br>Weld <input type="checkbox"/> Part Incorrect <input type="checkbox"/><br>Wrong Stock Pulled <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/><br>Out of Sequence <input type="checkbox"/> Part Moved <input type="checkbox"/><br>Off-set <input type="checkbox"/> Drawing <input type="checkbox"/><br>Misabeled <input type="checkbox"/> Finish <input type="checkbox"/><br>Fit/Function <input type="checkbox"/> Misread <input type="checkbox"/><br>Misaligned/off center <input type="checkbox"/> Turning Sequence <input type="checkbox"/> |                                                           |                                                                                                                                                                            |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | OTHER :                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                           |                                                                                                                                                                            |  |

# Work Order ID 136266

Friday, August 28, 2015 2:17:36 PM

**\*136266\***

Page 2

Item ID: D2580-1

Accept

**\*N900040100\***

Setup Start **\*NS1\***

Revision ID:

Stop **\*NS2\***

Item Name: 205 Bent Tube

Start Date: 8/28/2015 Start Qty: 6.00

**\*6\***

Cust Item ID:

Required Date: 8/28/2015 Req'd Qty: 6.00

**\*6\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***

Stop **\*NR2\***

| Sequence ID/<br>Work Center ID | Operation<br>Description                        | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp |
|--------------------------------|-------------------------------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| 110                            | Chemical Conversion Coat per QSI005 4.1         | 0.00                 |         |        |              | 6             |               | 15-9-10          | JH             |
| <b>*110*</b>                   |                                                 |                      |         |        |              |               |               |                  |                |
| HandFinish                     | Memo                                            | 0.03                 |         |        |              |               |               |                  |                |
| Hand Finishing                 |                                                 |                      |         |        |              |               |               |                  |                |
| 120                            | QC7-Inspect Chemical Conversion Coat            | 0.00                 |         |        |              | 6             | 0             | 15-09-10         |                |
| <b>*120*</b>                   |                                                 |                      |         |        |              |               |               |                  |                |
| QC                             | Memo                                            | 0.00                 |         |        |              |               |               |                  |                |
| Quality Control                |                                                 |                      |         |        |              |               |               |                  |                |
| 125                            |                                                 | 0.00                 |         |        |              | 6             |               | 15-9-10          | JH             |
| <b>*125*</b>                   |                                                 |                      |         |        |              |               |               |                  |                |
| Skid tubes                     | Memo                                            | 0.02                 |         |        |              |               |               |                  |                |
| Skid tubes                     | 1- Bond web in place per QSI 015. <u>133/36</u> |                      |         |        |              |               |               |                  |                |

A/R Sikaflex-291 batch: 132705  
Sikaflex expire date: 10-2-12  
Start time and date: 11:45 bond for 12hrs

DAS  
18  
9-09

**Work Order ID 136266****\*136266\***

Page 3

Friday, August 28, 2015 2:17:36 PM

Item ID: D2580-1

Accept

**\*N900040100\***

Setup Start

**\*NS1\***

Revision ID:

Stop

**\*NS2\***

Item Name: 205 Bent Tube

Start Date: 8/28/2015 Start Qty: 6.00

**\*6\***

Cust Item ID:

Required Date: 8/28/2015 Req'd Qty: 6.00

**\*6\***

Customer:

Reference:

Approvals:

Process Plan: \_\_\_\_\_

Date: \_\_\_\_\_

Tooling: \_\_\_\_\_

Date: \_\_\_\_\_

Run Start

**\*NR1\***

QC: \_\_\_\_\_

Date: \_\_\_\_\_

SPC (Y/N): \_\_\_\_\_

Date: \_\_\_\_\_

Stop

**\*NR2\***Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

130

QC5- Inspect part completeness to step on W/O

0.00

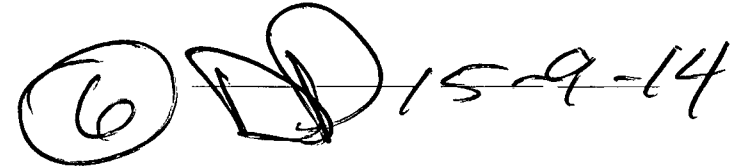
**\*130\***

QC

Memo

0.00

Quality Control

DAS  
03  
9-88

140

Identify as per dwg & Stock Location: LG001

0.00

**\*140\***

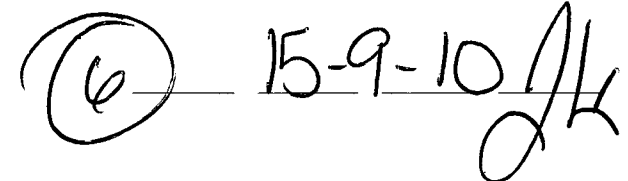
Packaging

Memo

0.00

Packaging

LOCATION : LG002



150

QC21- Final Inspection - Work Order Release

0.00

**\*150\***

QC

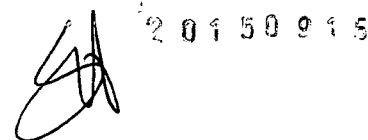
Memo

0.01

Quality Control

MC5

SEP 15 2015



# Picklist Print

Page 1

Friday, August 28, 2015 1:49:32 PM

Work Order ID: 136266

**\*136266\***

Parent Item: D2580-1

**\*D2580-1\***

Parent Item Name: 205 Bent Tube

Start Date: 8/28/2015

Required Date: 8/28/2015

Start Qty: 6.00

Required Qty: 6.00

Comments: IPP B01.11.08 Revised Step 9, 10, 12, and 13 SM IPP Rev:C  
10.12.01 as per DEO D1 DD ver:ec

| Component Item ID/<br>Item Name | Replacement<br>Item ID | Mfg/<br>Purch | Bin<br>Item | Primary<br>Location | Last<br>Location | Route<br>Seq ID | Unit of<br>Measure | Qty on<br>Hand | Qty per Kit | Total<br>Qty | Qty<br>Issued | Date<br>Issued | Status |
|---------------------------------|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|
|---------------------------------|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|

D2500-1-190

Manufactured

No

100

Each

8.0000

1

6

**\*D2500-1-190\***

Ext'n - 'I' Beam Tube 4"

**\*\***

15-9-9 JH

Location

134259

Loc Qty

Loc Code

LG002

8

120085

8

4+1  
2

⑦

D2596

Manufactured

No

100

Each

4.0000

1

6

**\*D2596\***

Web, 205 Skidtube

**\*\***

15-9-10 JH

Location

136161

Loc Qty

Loc Code

LG002

4

135456

4

6

DQA: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                              |  |                                                                                                                                                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |                                                                                                                                                     |  |  |
|--------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____ |  | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/> |  | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>             Skid-tube <input type="checkbox"/><br/>             Machining <input type="checkbox"/><br/>             Thermoforming <input type="checkbox"/><br/>             Large Fab <input type="checkbox"/> </div> <div>             Cross tube <input type="checkbox"/><br/>             Small Fab <input type="checkbox"/><br/>             Finishing <input type="checkbox"/><br/>             Composite <input type="checkbox"/> </div> <div>             Water Jet <input type="checkbox"/><br/>             Prod. Eng. Coord. <input type="checkbox"/><br/>             Rec/Store/Packaging <input type="checkbox"/><br/>             Supplier <input type="checkbox"/> </div> <div>             Engineering <input type="checkbox"/><br/>             Quality <input type="checkbox"/><br/>             Other <input type="checkbox"/> </div> </div> |  |  |                                                                                                                                                     |  |  |
| Date :                                                       |  | Step #:                                                                                                                                                                            |  | QTY Effective :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  | MRB (QS1042) Approval<br><br><br>Completed By<br><br><br>Lead hand / Supervisor<br>Approval Verification<br><br><br>QC / QA Coordinator<br>Approval |  |  |
| Description Work Order Deviation                             |  |                                                                                                                                                                                    |  | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |                                                                                                                                                     |  |  |
|                                                              |  |                                                                                                                                                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |                                                                                                                                                     |  |  |

| Root Cause                           |                                 |                                   |                                        | FAULT CATEGORY                        |                                   |                                             |                                           |                              |                                     |                                           |                                        |                                             |                                   |                                       |                                   |                                   |                                          |                                           |                                  |                                              |                                              |                                                |                                   |                                          |                                  |                                                |                                 |                                                 |                                |                                   |                                     |                                             |                                        |                                           |                                 |                                    |                                               |                                                            |                                        |                                      |                                        |                                                          |                                      |                                           |                                        |                                |                               |                                             |                                          |                                  |                                     |                                       |                                                |                                           |                                             |                                               |                                         |                                            |                                     |                                  |                                 |                                  |                                           |
|--------------------------------------|---------------------------------|-----------------------------------|----------------------------------------|---------------------------------------|-----------------------------------|---------------------------------------------|-------------------------------------------|------------------------------|-------------------------------------|-------------------------------------------|----------------------------------------|---------------------------------------------|-----------------------------------|---------------------------------------|-----------------------------------|-----------------------------------|------------------------------------------|-------------------------------------------|----------------------------------|----------------------------------------------|----------------------------------------------|------------------------------------------------|-----------------------------------|------------------------------------------|----------------------------------|------------------------------------------------|---------------------------------|-------------------------------------------------|--------------------------------|-----------------------------------|-------------------------------------|---------------------------------------------|----------------------------------------|-------------------------------------------|---------------------------------|------------------------------------|-----------------------------------------------|------------------------------------------------------------|----------------------------------------|--------------------------------------|----------------------------------------|----------------------------------------------------------|--------------------------------------|-------------------------------------------|----------------------------------------|--------------------------------|-------------------------------|---------------------------------------------|------------------------------------------|----------------------------------|-------------------------------------|---------------------------------------|------------------------------------------------|-------------------------------------------|---------------------------------------------|-----------------------------------------------|-----------------------------------------|--------------------------------------------|-------------------------------------|----------------------------------|---------------------------------|----------------------------------|-------------------------------------------|
| <input type="checkbox"/> Environment | <input type="checkbox"/> Design | <input type="checkbox"/> Doc/Data | <input type="checkbox"/> Equip/Tooling | <input type="checkbox"/> Handling/Pre | <input type="checkbox"/> Material | <input type="checkbox"/> Internal Transport | <input type="checkbox"/> Tribal Knowledge | <input type="checkbox"/> LOA | <input type="checkbox"/> Substation | <input type="checkbox"/> Past Expiry Date | <input type="checkbox"/> Misidentified | <input type="checkbox"/> No Re-verification | <input type="checkbox"/> Operator | <input type="checkbox"/> Offset/Setup | <input type="checkbox"/> Supplier | <input type="checkbox"/> Training | <input type="checkbox"/> Use for Testing | <input type="checkbox"/> Poor Information | <input type="checkbox"/> Rushing | <input type="checkbox"/> Product Improvement | <input type="checkbox"/> Process Improvement | <input type="checkbox"/> Manufacturing Process | <input type="checkbox"/> Past Due | <input type="checkbox"/> Pressure/Forced | <input type="checkbox"/> Bending | <input type="checkbox"/> Centre Not Concentric | <input type="checkbox"/> Cracks | <input type="checkbox"/> Crimp/Kink/Ripple/Wave | <input type="checkbox"/> Cuffs | <input type="checkbox"/> Crushing | <input type="checkbox"/> Heat Treat | <input type="checkbox"/> Wave/Twist in Tube | <input type="checkbox"/> Marks/Chatter | <input type="checkbox"/> Temperature/Cure | <input type="checkbox"/> Set-up | <input type="checkbox"/> BOM/Route | <input type="checkbox"/> Broken/Damage/Defect | <input type="checkbox"/> Inspection Incomplete/Unqualified | <input type="checkbox"/> Contamination | <input type="checkbox"/> Countersink | <input type="checkbox"/> Cut Too Short | <input type="checkbox"/> Instructions Incomplete/Unclear | <input type="checkbox"/> Drill Holes | <input type="checkbox"/> Power Loss/Surge | <input type="checkbox"/> Folio/Program | <input type="checkbox"/> Grain | <input type="checkbox"/> Weld | <input type="checkbox"/> Wrong Stock Pulled | <input type="checkbox"/> Out of Sequence | <input type="checkbox"/> Off-set | <input type="checkbox"/> Mislabeled | <input type="checkbox"/> Fit/Function | <input type="checkbox"/> Misaligned/off center | <input type="checkbox"/> Positioned Wrong | <input type="checkbox"/> Outside Dimensions | <input type="checkbox"/> Over/Under tolerance | <input type="checkbox"/> Part Incorrect | <input type="checkbox"/> Part Lost/Missing | <input type="checkbox"/> Part Moved | <input type="checkbox"/> Drawing | <input type="checkbox"/> Finish | <input type="checkbox"/> Misread | <input type="checkbox"/> Turning Sequence |
|                                      |                                 |                                   |                                        |                                       |                                   |                                             |                                           |                              |                                     |                                           |                                        |                                             |                                   |                                       |                                   |                                   |                                          |                                           |                                  |                                              |                                              |                                                |                                   | OTHER :                                  |                                  |                                                |                                 |                                                 |                                |                                   |                                     |                                             |                                        |                                           |                                 |                                    |                                               |                                                            |                                        |                                      |                                        |                                                          |                                      |                                           |                                        |                                |                               |                                             |                                          |                                  |                                     |                                       |                                                |                                           |                                             |                                               |                                         |                                            |                                     |                                  |                                 |                                  |                                           |

136266 SH 20150901

| LIST OF MATERIALS |          |          |          |          | PART NUMBER                                                               | DESCRIPTION         |
|-------------------|----------|----------|----------|----------|---------------------------------------------------------------------------|---------------------|
| ITEM              | QTY -041 | QTY -045 | QTY -047 | QTY -049 |                                                                           |                     |
| 1                 | X        |          |          |          | D2580-041                                                                 | SKIDTUBE ASSEMBLY   |
| 2                 |          | X        |          |          | D2580-045                                                                 | SKIDTUBE ASSEMBLY   |
| 3                 |          |          | X        |          | D2580-047                                                                 | SKIDTUBE ASSEMBLY   |
| 4                 |          |          |          | X        | D2580-049                                                                 | SKIDTUBE ASSEMBLY   |
| 20                | 1        | 1        | 1        | 1        | D2500-1-190                                                               | EXTRUSION           |
| 21                |          |          | 16       | 16       | D2570                                                                     | BUSHING             |
| 22                | 1        | 1        | 1        | 1        | D2576-3                                                                   | STEP                |
| 23                |          | 4        |          |          | D2579                                                                     | SPACER              |
| 24                | 16       | 16       | 8        | 8        | D2594-1                                                                   | PLUG                |
| 25                | 16       | 16       | 8        | 8        | D2594-3                                                                   | O-RING              |
| 26                | 1        | 1        | 1        | 1        | D2596                                                                     | 205 WEB             |
| 27                | 1        | 1        | 1        | 1        | D2855                                                                     | AFT CAP             |
| 28                | 1        | 1        |          |          | D3564-5                                                                   | WEARSHOE            |
| 29                | 1        | 1        |          |          | D3564-9                                                                   | WEARSHOE            |
| 30                | 1        | 1        |          |          | D3564-11                                                                  | WEARSHOE            |
| 31                | 1        | 1        |          |          | D3564-13                                                                  | WEARSHOE            |
| 32                | 2        | 2        |          |          | D3566-1                                                                   | GASKET              |
| 33                | 1        | 1        |          |          | D3566-5                                                                   | GASKET              |
| 34                | 1        | 1        |          |          | D3566-13                                                                  | GASKET              |
| 35                | 20       | 20       | 24       | 24       | D4202-1                                                                   | SPACER              |
| 36                |          |          | 1        |          | D4408-041                                                                 | WEARPLATE ASSEMBLY  |
| 37                |          |          | 1        |          | D4408-043                                                                 | WEARPLATE ASSEMBLY  |
| 37                |          |          |          | 1        | D5061-1                                                                   | FWD WEARPLATE       |
| 37                |          |          |          | 1        | D5061-3                                                                   | AFT WEARPLATE       |
| 50                | 50       | 50       |          |          | ALS7-1032-130<br>or AKS7-1032-130<br>or AKS4-1032-130<br>or AELS-1032-130 | INSERT              |
| 51                | 50       | 50       |          |          | AN3CA4                                                                    | BOLT                |
| 52                | 2        | 2        | 2        | 2        | AN3-5A                                                                    | BOLT                |
| 53                |          |          | 8        | 8        | AN4-45A                                                                   | BOLT                |
| 54                | 50       | 50       |          |          | NAS1149C0332R                                                             | WASHER (AN960C10L)  |
| 55                | 2        | 2        | 2        | 2        | NAS1149D0332J                                                             | WASHER (AN960J010L) |
| 56                |          |          | 8        | 8        | MS21042-4                                                                 | NUT (OR MS21042L4)  |

GENERAL NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: CHEMICAL CONVERSION PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB POWDER COAT ASSEMBLY (-041/-047/-049) GLOSS WHITE (REF 4.3.5.1) PER DART QSI 005 4.3 BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4.
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: D2580-041 = 34.5 lbs  
D2580-045 = 34.5 lbs  
D2580-047 = 45.1 lbs  
D2580-049 = 32.0 lbs
- 8) WELDING PER DART QSI 004.
- 9) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 10) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 11) USE DART DRILL TEMPLATE DT6217 & DT8937 ONLY FOR D2580-041/-045 TO LOCATE AND DRILL Ø0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTIONS B-B AND F-F (60 PLACES) AFTER FINISH. INSTALL AN3CA4 BOLTS AND NAS1149C0332R WASHERS WITH SIKAFLEX-241-281.
- 12) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES FOR D2580-041/-045 AND 8 PLACES FOR D2580-047/-049)
- 13) IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE WITH THE SPACER AT THIS LOCATION

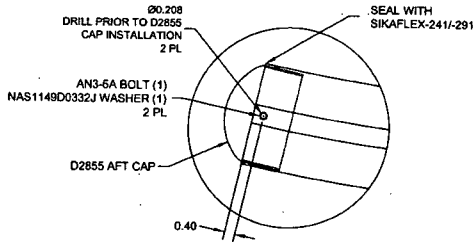
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2014-04-29

|            |                                                                                                                                                           |                                                                                                                                                                                                                                                                 |              |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| G          | ADDED -049 -047 WEIGHT UPDATED PER DSI 9598                                                                                                               | AJS                                                                                                                                                                                                                                                             | 14.04.09     |
| F          | INCORPORATE DEO D2580-E-1 PER PAR12-218                                                                                                                   | DC                                                                                                                                                                                                                                                              | 13.06.20     |
| E          | ADD D2580-047 (ZN C4-7) AND D2580-7 (ZN B3-8). INCLUDED DEO D2580-D-1; REFORMATTED DRAWING TO CURRENT STANDARDS; DT8217 & DT8937 WAS TD2577-205 (ZN C4-1) | RF                                                                                                                                                                                                                                                              | 11.06.21     |
| D          | CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124/ 9183                                                                                               | PH                                                                                                                                                                                                                                                              | 07.04.05     |
| C          | REDRAWN, INCLUDED DEO 9094/ 9097                                                                                                                          | CP                                                                                                                                                                                                                                                              | 98.09.26     |
| B          | AS MANUFACTURED                                                                                                                                           | DS                                                                                                                                                                                                                                                              | 96.12.02     |
| A          | NEW ISSUE                                                                                                                                                 | DS                                                                                                                                                                                                                                                              | 96.09.16     |
| REV.       | DESCRIPTION                                                                                                                                               | BY                                                                                                                                                                                                                                                              | DATE         |
| DESIGN     | DS                                                                                                                                                        |                                                                                                                                                                                                                                                                 |              |
| DRAWN      | AJS                                                                                                                                                       |                                                                                                                                                                                                                                                                 |              |
| CHECKED    | A.P.                                                                                                                                                      | DART AEROSPACE LTD                                                                                                                                                                                                                                              |              |
| MFG. APPR. |                                                                                                                                                           | HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                     |              |
| APPROVED   |                                                                                                                                                           | DRAWING NO.                                                                                                                                                                                                                                                     | REV. G       |
| DE APPR.   |                                                                                                                                                           | D2580                                                                                                                                                                                                                                                           | SHEET 1 OF 9 |
| DATE       | 14.04.09                                                                                                                                                  | TITLE                                                                                                                                                                                                                                                           | SCALE        |
|            |                                                                                                                                                           | 205 SKIDTUBE ASSEMBLY                                                                                                                                                                                                                                           | NTS          |
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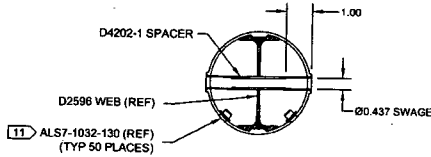
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D2580-041 ASSEMBLY DETAIL

DETAIL A C7-2  
SCALE 5X

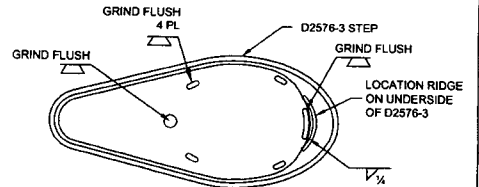


SECTION B-B D5-2  
SCALE 5X



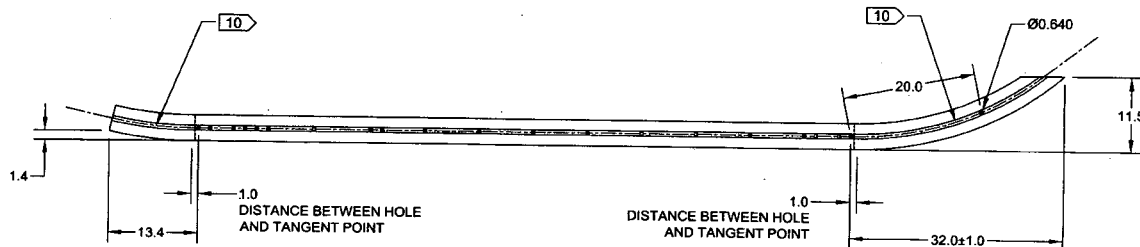
- AFTER DRILLING AND BENDING ASSEMBLY  
PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:
1. INSERT D4202-1 SPACER (20 PLACES)
  2. SWAGE TO Ø0.437 X 1.00 DEEP PER QSI 002
  3. TRIM / GRIND FLUSH PER QSI 002

DETAIL C D3-2  
SCALE 5X



|           |          |                                        |              |
|-----------|----------|----------------------------------------|--------------|
| DESIGN    | DS       | DART AEROSPACE LTD                     |              |
| DRAWN     | AJS      | HAWKESBURY, ONTARIO, CANADA            |              |
| CHECKED   | AP       | DRAWING NO.                            | REV. G       |
| MFG APPR. |          | D2580                                  | SHEET 2 OF 9 |
| APPROVED  |          | TITLE                                  | SCALE        |
| DE APPR.  |          | 205 SKIDTUBE ASSEMBLY                  | NTS          |
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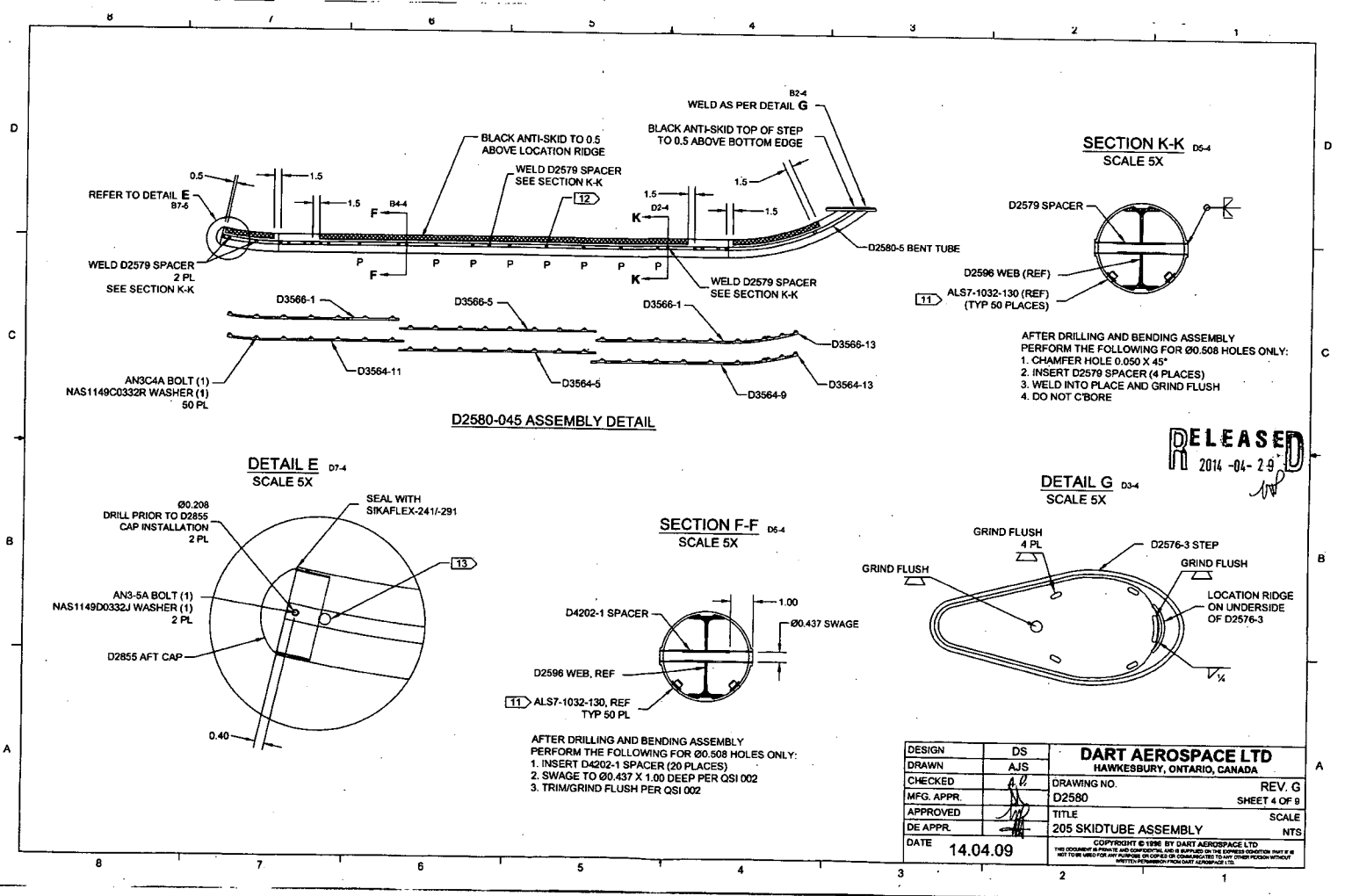


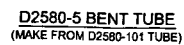
D2580-1 BENT TUBE  
(MAKE FROM D2580-T01 TUBE)

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2014-04-29

|            |          |                                        |              |
|------------|----------|----------------------------------------|--------------|
| DESIGN     | DS       | <b>DART AEROSPACE LTD</b>              |              |
| DRAWN      | AJS      | HAWKESBURY, ONTARIO, CANADA            |              |
| CHECKED    | A.P.     | DRAWING NO.                            | REV. G       |
| MFG. APPR. |          | D2580                                  | SHEET 3 OF 9 |
| APPROVED   |          | TITLE                                  | SCALE        |
| DE APPR.   |          | 205 SKIDTUBE ASSEMBLY                  | NTS          |
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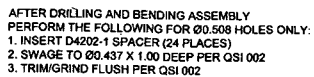




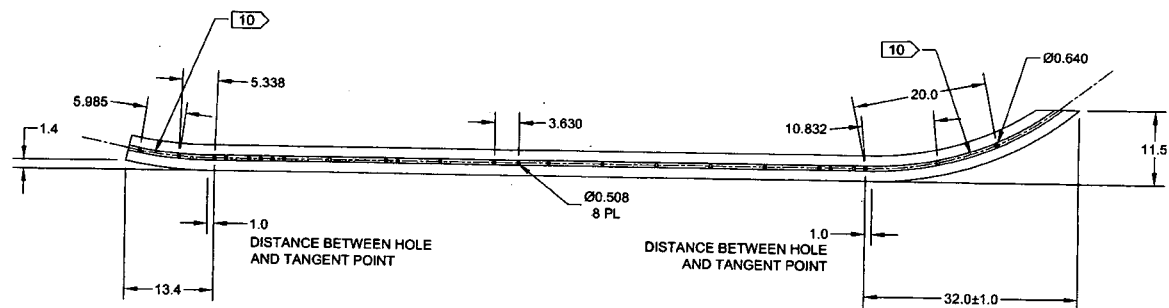
2014-04-29

|            |            |                                                                                                                                                                                                                                      |              |
|------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | DS         | <b>DART AEROSPACE LTD</b>                                                                                                                                                                                                            |              |
| DRAWN      | AJS        | HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                          |              |
| CHECKED    | <i>AJS</i> | DRAWING NO.                                                                                                                                                                                                                          | REV. G       |
| MFG. APPR. | <i>AS</i>  | D2580                                                                                                                                                                                                                                | SHEET 5 OF 9 |
| APPROVED   | <i>AS</i>  | TITLE                                                                                                                                                                                                                                | SCALE        |
| DE APPR.   | <i>AS</i>  | 205 SKIDTUBE ASSEMBLY                                                                                                                                                                                                                | NTS          |
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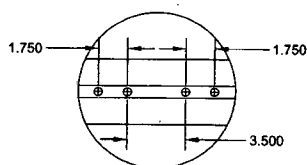
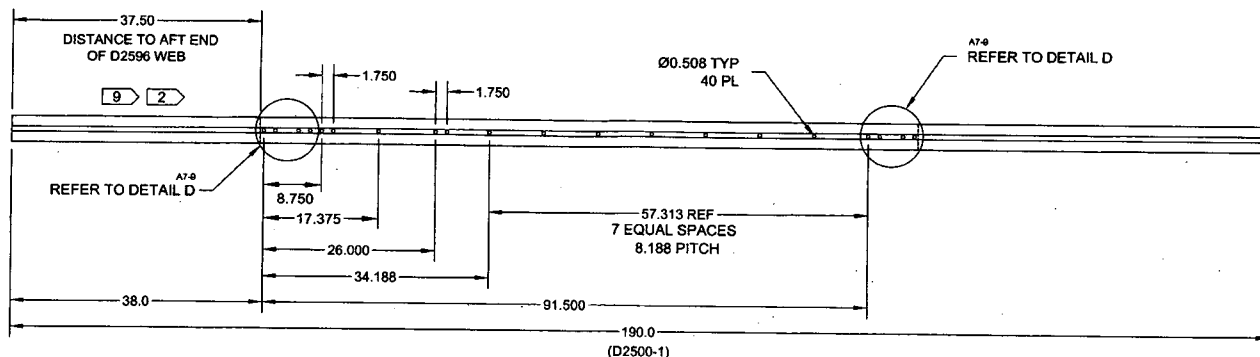
|            |           |                                                                                                                                                                                                                                                                       |              |
|------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | DS        | <b>DART AEROSPACE LTD</b>                                                                                                                                                                                                                                             |              |
| DRAWN      | AJS       | HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                           |              |
| CHECKED    | <i>AS</i> | DRAWING NO.                                                                                                                                                                                                                                                           | REV. G       |
| MFG. APPR. | <i>AS</i> | D2580                                                                                                                                                                                                                                                                 | SHEET 7 OF 8 |
| APPROVED   | <i>AS</i> | TITLE                                                                                                                                                                                                                                                                 | SCALE        |
| DE APPR.   | <i>AS</i> | 205 SKIDTUBE ASSEMBLY                                                                                                                                                                                                                                                 | NTS          |
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D2580-7 BENT TUBE  
(MAKE FROM D2580-101 TUBE)

RELEASED  
2014-04-29

|            |          |                                        |              |
|------------|----------|----------------------------------------|--------------|
| DESIGN     | DS       | DART AEROSPACE LTD                     |              |
| DRAWN      | AJS      | HAWKESBURY, ONTARIO, CANADA            |              |
| CHECKED    | A.P.     | DRAWING NO.                            | REV. G       |
| MFG. APPR. |          | D2580                                  | SHEET 8 OF 8 |
| APPROVED   |          | TITLE                                  | SCALE        |
| DE APPR.   |          | 205 SKIDTUBE ASSEMBLY                  | NTS          |
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DETAIL D  
C3-9  
C7-9  
SCALE 5X

D2580-101 TUBE

**RELEASED**  
2014-04-29

|            |          |                                                                                                                                                                                        |              |
|------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | DS       | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA                                                                                                                               |              |
| DRAWN      | AJS      |                                                                                                                                                                                        |              |
| CHECKED    | AP       | DRAWING NO.                                                                                                                                                                            | REV. G       |
| MFG. APPR. | AP       | D2580                                                                                                                                                                                  | SHEET 9 OF 9 |
| APPROVED   | AP       | TITLE                                                                                                                                                                                  | SCALE        |
| DE APPR.   | AP       | 205 SKIDTUBE ASSEMBLY                                                                                                                                                                  | NTS          |
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